Homework 2

This problem set is due February 6th.

Reading For Monday read the Introduction and Section 1.1; For Wednesday read Sections A.1 and A.2; For Friday read Section A.3.

Problem 1 Compute the following by hand: $\left(\frac{3}{97}\right)$, $\left(\frac{33}{11}\right)$, and $\left(\frac{5!}{7}\right)$.

Problem 2 Using the fact that there is a primitive root mod p, show directly that $\left(\frac{-3}{p}\right) = 1$ if $p \equiv 1 \pmod 3$.
Hint: show that there is an element c in $(\mathbf{Z}/p\mathbf{Z})^\times$ of order three and show that $(2c+1)^2 \equiv -3 \pmod p$.

Problem 3 Problem 1.2 on p. 32

Problem 4 Problem 1.7 on p. 33

Problem 5 Problem A.3 parts (a) and (b) on p. 255

Problem 6 Problem A.8 part (a) on p. 256